

CLAIMS

1-35. (Previously cancelled)

1 36. (Previously Presented) A mat comprising
2 a plurality of discontinuous reinforcement fibers, wherein the
3 reinforcement fibers have at least a 9 to 1 machine to cross direction mat strength
4 ratio, and
5 a thermoplastic component selected from the group consisting of
6 polyethylene, polypropylene, polyethylene terephthalate (PET), polyamides,
7 polyethylene naphthalate (PEN), polyetheretherketone (PEEK) and
8 polyetherketoneketone (PEKK),
9 wherein concentration of reinforcement fiber components to thermoplastic
10 components is in a range of 60-70% by weight of reinforcement fibers to 40-30%
11 by weight of thermoplastic components,
12 and wherein a basis weight of said mat falls within the range of 68 to 339
13 gm/square meters, and wherein the reinforcement fibers are selected from the
14 group consisting of carbon; glass; para-amid; ceramics; metals; high temperature
15 thermoplastics; thermosets; liquid crystal polymer fibers; ultra high molecular
16 weight polyethylene and natural or synthetic spider web.

1 37. (Previously Presented) A mat comprising
2 a plurality of discontinuous reinforcement fibers having at least a 90%
3 machining direction orientation;
4 and
5 a thermoplastic component selected from the group consisting of
6 polyethylene, polypropylene, polyethylene terephthalate (PET), polyamides,
7 polyethylene naphthalate (PEN), polyetheretherketone (PEEK) and
8 polyetherketoneketone (PEKK),
9 wherein concentration of reinforcement fiber components to thermoplastic
10 components is in a range of 60-70% by weight of reinforcement fibers to 40-30%
11 by weight of thermoplastic components,
12 wherein a basis weight of said mat falls within the range of 68 to 339 gm/square
13 meters, and wherein the reinforcement fibers are selected from the group

consisting of carbon; glass; para-amid; ceramics; metals; high temperature thermoplastics; thermosets; liquid crystal polymer fibers; ultra high molecular weight polyethylene and natural or synthetic spider web.

38-39. (Previously Cancelled)

40. (Previously Presented) A product comprising a plurality of mats, each of said mats comprising
a plurality of discontinuous reinforcement fibers having at least a 90% wetlay orientation, and
a thermoplastic component selected from the group consisting of polyethylene, polypropylene, polyethylene terephthalate (PET), polyamides, polyethylene naphthalate (PEN), polyetheretherketone (PEEK) and polyetherketoneketone (PEKK),
wherein concentration of reinforcement fiber components to thermoplastic components is in a range of 60-70% by weight of reinforcement fibers to 40-30% by weight of thermoplastic components,
and wherein a basis weight of each of said mats falls within the range of 68 to 339 gm/square meters, and wherein the reinforcement fibers are selected from the group consisting of carbon; glass; para-amid; ceramics; metals; high- temperature thermoplastics; thermosets; liquid crystal polymer fibers; ultra high molecular weight polyethylene and natural or synthetic spider web.

41. (Original) The product of claim 40 wherein at least one of said mats has been heated in an oven, compression molded, hot stamped, continuously formed in a belt press, continuously shape-formed by hot roller pressing, continuously shaped by reciprocal stamping, formed through pultrusion, or continuously manufactured to form structural rods, ropes and cables.

42. (Original) The product of claim 40, wherein each of said mats have different fiber components and fiber orientations.

43. (Previously Cancelled)

44. (Original) A mat according to claim 36, wherein the reinforcement fibers are polyacrylonitrile (PAN) carbon.

45. (Withdrawn) A mat according to claim 36, wherein the reinforcement fibers are pitch carbon.

46. (Previously Presented) The mat of claim 36, wherein the reinforcement fibers have fiber lengths in a range of about 0.6 cm to 6.35 cm.

47. (Previously Presented) The mat of claim 46, wherein the reinforcement fibers have fiber lengths in a range of 1.9 cm to 3.2 cm.

48. (Previously Presented) The mat of claim 36, wherein the reinforcement fibers adhere to the thermoplastic component.

49. (Previously Presented) The mat of claim 36, wherein the reinforcement fibers are all made of one material and have at least substantially the same length and diameter.

50. (Previously Presented) The mat of claim 36, wherein the reinforcement fibers are made of a mixture of materials, and have different lengths, diameters and compositions.

51. (Previously Presented) The mat of claim 36, wherein the thermoplastic component is selected from the group consisting of fibers, granular particles and flat platelets.

52. (Previously Presented) The mat of claim 36, wherein the thermoplastic component includes fibers with lengths in a range of 0.6 cm to 1.9 cm.

53. (Previously Presented) The mat of claim 36, wherein the thermoplastic component is drawn fibers or undrawn fibers.

1 54. (Previously Presented) The mat of claim 36, wherein the thermoplastic
2 component is made of the same material and of substantially same size members.

1 55. (Previously Presented) The mat of claim 36, wherein the thermoplastic
2 component is made of a mixture of materials, of different sizes and melting points.

1 56. (Previously Presented) The mat of claim 36, further comprising an
2 additional material selected from the group consisting of fillers, antioxidants,
3 coloring agents, electrically-conductive materials, electrically-insulating materials,
4 thermally-conductive materials, thermally-insulating materials, adhesion aids, melt
5 flow modifiers, cross-linking agents, chemically-reactive materials, biologically-
6 reactive materials and molecular sieves.